

Inquiry Lesson Plan

Grade/Content Area	7 th Grade / Mathematics
Lesson Title	<i>The Bargain Hunter</i>
State Standards: GLEs/GSEs National Content Standards:	<p>GLE / GSE: N&O 7-1 Comparing percent of one number to percent of another number. N&O 7-4 Accurately solve problems involving percent discounts, sales tax and tips.</p> <p>National: N&O</p> <ul style="list-style-type: none"> - Understand numbers, ways of representing numbers, relationships among numbers, and number systems - Understand meanings of operations and how they relate to one another - Compute fluently and make reasonable estimates
Context of the Lesson <i>Where does this lesson fit in the curriculum and instructional context? Is it the opening of a unit or a series of lessons?</i>	<p>The students are in the middle of a unit on percents and proportional reasoning. They have already discovered the relation from fractional percentages to decimal percentages. This lesson will allow students to apply their new knowledge of decimal percentage representation to some practical examples. The lesson will take a full class period (50 minutes) and will conclude this section of the unit.</p>
Opportunities to Learn <i>Differentiation: Materials, Learners and Environments</i>	<p>Plans to differentiate instruction: This lesson has students interacting with their peers as they develop their ability to compare percentages and draw conclusions from their calculations. For some students, they will learn from teaching, as they present their findings to the class, while other students will largely benefit from the guided solutions done out in their entirety on the board after the activity. Every five minutes, students will be changing from station to station, keeping the problem at hand novel and interesting and allowing for movement.</p> <p>Accommodations and modifications: Some students in the class have a learning disability and are non-homogeneously grouped. With this inclusive setting, the struggling students learn through observation and involvement with their peers while the general level students benefit from learning through teaching. For the students with more severe cognitive disabilities, I will omit the tax element for this exercise so that each item will only have one percent determining its final cost rather than two. Much of the lesson,</p>

Cornelis de Groot 10/20/09 9:02 AM

Comment: A better word is quantity. Number is a mathematical way to express the size of a quantity. Quantities have attributes, numbers don't. I'm getting technical here.

Cornelis de Groot 10/20/09 9:03 AM

Comment: Explaining?

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Comment: heterogeneously

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Comment: do you mean explaining?

	<p>however, is inclusive and involved. With scaffolding and peer assistance, most of the students should gain a stronger understanding through the group work or the recap discussion at the end of the lesson.</p> <p>Environment factors: The classroom will be divided into five “stores” where each of the five four-person groups will rotate to every five minutes.</p> <p>Materials: “Shopping List” Handout & Signs for above stations (attached)</p>
Objectives	<ul style="list-style-type: none"> Students will demonstrate proficiency in calculating percentages by successfully completing a set of problems involving percent discount and tax. Given the same products from a series of businesses offering different discounts, students will be able select the best deal after the given discounts are applied.
Instructional Procedures	<p>LAUNCH: Begin the class with a review of decimal representations of percentages by asking the students to provide examples of percentages and their decimal equivalents. “When I say a value like 30% what does this mean in decimals? How would you plug it into your calculator?”</p> <p>Review the role of multiplication (x) as the word “of” in a mathematical sentence and guide students, through questioning, to join a number and a percentage through multiplication to compute the percentage of the given number. “How would you say this expression in words: 0.15×15”</p> <p>“Can anyone share some places we could use percentages out of the classroom?” (Tips, Sales, Tax...)</p> <p>Introduce today’s activity: “Today you will be working in the groups that you were in for the last station activity. I have set up five stations around the room, each representing a different electronics store, and I am passing out a shopping list for you. On the list you’ll see the items that your group needs to buy: 3 ipod nanos, 2 ihomes and 2 pairs of earbuds. Every store sells these items at exactly the same cost but each of the five stores is offering different discounts. Each group will have five minutes at each store to calculate how much they will spend, in total, at each store. Work with your group members and read each store’s</p>

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Comment: Good, this brings the lesson to the level of inquiry-based.

Cornelis de Groot 10/24/09 1:38 PM

Comment: Have you ever noticed that the % symbol actually represents a fraction?

Cornelis de Groot 10/24/09 1:40 PM

Comment: How about “What percent is 50 of 100?” Isn’t that division? Teaching “key words” is know to be highly problematic.

Cornelis de Groot 10/24/09 1:47 PM

Comment: Do you know the difference between percent and percentage? You seem to use them interchangeably. See dictionary definitions at end of this lesson. I generally think of a percent as a number (30%) and a percentage as the part of a given whole (quantity) this number (fraction) represents. Do you think it is important to keep these terms separate or is it okay to interchange? I just want you to think about that, not necessarily change anything.

	<p>discount closely. Keep track of how much you will spend at each store and be prepared to present which store you would prefer to shop at to the class.”</p> <p>EXPLORE: Circulate through groups and offer guiding questions and assistance where needed. “Does this answer make sense? When the store is offering a discount of any kind, what do we know must be true about the final cost?”</p> <p>Keep students on task. (Though they are already grouped in a way that is generally functional, adjust grouping early on if a problem arises.)</p> <p>If there seems to be one student doing the majority of the work in a group, take a moment with the group and ask other students to volunteer their answers or explain their findings. For groups that continue to struggle, offer scaffolding by revealing the first step of a problem.</p> <p>“I see you’ve written _____. What does this mathematical statement mean in words? How did you know to compute _____ from the description of the discount?” or “You look stuck. Before we try to figure out the answer, how can we write out this store’s discount numerically?”</p> <p>SUMMARIZE/SHARE : After completing the activity, have each group stand and present their findings to the class. Ask students which store they would prefer to shop at and why. Offer each group the opportunity to present any unexpected findings by sharing what surprised them.</p> <p>“After going from store to store, which store is the most expensive? Which is the least expensive? Can you explain why?”</p> <p>“Did some of the results surprise you? When you saw the ‘buy two get one free’ and the ‘35% off the total cost’ advertisements, which did you expect to save you the most money in the end?”</p> <p>After a consensus (or a passionate division!) has been reached regarding the store of choice for a bargain hunter, compute the</p>
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Comment: Have you thought of an extra challenge for those who find this too easy? Make a sixth “challenge” station, where the store offers an additional 20% off, with an initial sale of 80%. Ask the question if the item is now for free. Have students justify why they think so or not. Do you see that this needs a deeper understanding of percents as fractions. That is, the whole for the additional 20% off is not the same as the whole for the 80% off. This is a key idea. This also lifts your lesson beyond an independent practice session.

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Comment: Excellent! This problem is also quite challenging. GOOD.

Lesson Plan

	<p>total cost of the stores in question on the board, relying heavily on student dictation. Have students suggest the order of steps and complete the calculations. Use this as an opportunity to address any misconceptions and miscalculations as well as provide a model for those students still struggling.</p> <p>“You’ve calculated 25% of # in this way _____. Try saying this calculation as you’ve written it out loud. Is this what you meant to compute? How can we change this to calculate what you’re saying in words?”</p>
Assessment	<p>Launch: Students will be pre-assessed on their knowledge and understanding of using percents. During the initial questioning I will make an assessment of how ready the students are to begin the activity. If students are not accurately converting percents to decimals and are not able to put given percentage calculations into word, I will know they are not ready for the activity and we will stay on the review stage until they demonstrate understanding.</p> <p>Explore: Students will be assessed formally and informally during the explore phase as I walk from group to group. From their responses on paper I will know quantitatively if they are getting the correct answers. From their explanations and conversations I will be able to determine if an incorrect answer on paper is merely computational or if it indicates a lack of understanding.</p> <p>Summarize: Like the explore phase, the summarize phase will be assessed both formally and informally. If their answers are correct and they have selected the least expensive store, they have achieved their objective. Informally, I will be assessing as I question the students for the steps necessary to complete any given problem on the board.</p>
<p>Reflections <i>This section to be completed only if lesson plan is implemented.</i></p>	<p>Student Work Sample 1 – Approaching Proficiency: Student Work Sample 2 – Proficient: Student Work Sample 3 – Exceeds Proficiency: Lesson Implementation:</p>

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Comment: I can see someone taught you well about assessment ☺. You keep a keen eye on your objectives. YEAH!

Shopping List

☐ **3** iPod nano (8GB) – \$149.99 each

☐ **2** iHome radio dock - \$89.99 each

☐ **2** Skullcandy earbuds - \$21.99 each

Best Buy Total Cost _____ Radio Shack Total Cost _____

Target Total Cost _____ Wal Mart Total Cost _____

Apple Store Total Cost _____

Shopping List

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Best Buy Total Cost _____ Radio Shack Total Cost _____

Target Total Cost _____ Wal Mart Total Cost _____

Apple Store Total Cost _____

Station Signs:

BEST BUY

35% off all iPods and iPod accessories

*RI Sales Tax of 7% applied *before* the discount

Radio Shack

iPods – Buy 2 get 1 free!

*RI Sales Tax of 7% applied *before* the discount

Target

Happy Tax Free Day in MA!

Take an additional 25% off your entire purchase

Cornelis de Groot 10/24/09 1:57 PM

Comment: In addition to what? They pay no sales tax, but that is simply not added.

Wal Mart

iPods – Buy 2 get 1 50% off.

50% all iPod accessories

*RI Sales Tax of 7% applied *before* the discount

Cornelis de Groot 10/24/09 1:56 PM

Comment: 150% ? This is not clear.

Apple Store

Free Skullcandy Earbuds with each iPod purchase

Clearance: 75% off iHome

*RI Sales Tax of 7% applied *after* the discount

Best Buy \$485.24
Radio Shack \$571.12
Target \$505.45
Wal Mart \$534.14
Apple Store \$529.61

percent |pər'sent| (also chiefly Brit. per cent)

adverb

by a specified amount in or for every hundred : new car sales may be down nineteen

percent | staff rejected a 1.8 percent increase.

noun

one part in every hundred : a reduction of half a percent or so in price.

- the rate, number, or amount in each hundred; percentage : the percent of drug users who are infected.

ORIGIN mid 16th cent.: from per + cent , perhaps an abbreviation of pseudo-Latin per centum.

USAGE Both spellings, percent and per cent, are acceptable, but consistency should be maintained. Percent is more common in U.S. usage; per cent is more common in British usage.

percentage |pər'sentij|

noun

a rate, number, or amount in each hundred : the percentage of Caesareans at the hospital was three percent higher than the national average | [as adj.] a large percentage increase in the population over 85.

- an amount, such as an allowance or commission, that is a proportion of a larger sum of money : I hope to be on a percentage.

- any proportion or share in relation to a whole : only a small percentage of black Americans have Caribbean roots.

- [in sing.] informal personal benefit or advantage : you explain to me the percentage in looking like a hoodlum.

PHRASES

play the percentages (or the percentage game) informal choose a safe and methodical course of action when calculating the odds in favor of success. [ORIGIN: referring to the calculated percentage of success from statistics.]